

Stuart C. Hansen
09/976,417

Applicant's mass spectrometer as recited in claim 1 includes an ion source, a flight tube and a three electrode ion mirror integral with the flight tube for retarding and reflecting ions from the ion source. This enables each of the electrodes in the ion mirror to be easily aligned and mounted with permanent high precision and accuracy relative to the flight tube and other elements of the mass spectrometer.

The applied reference of Zhang et al. does not disclose an ion mirror integral with a flight tube. Since no flight tube is disclosed in this reference, there is no teaching or suggestion that the flight tube is integral with the ion mirror as recited in claim 1. The "field free region" described in Zhang et al. defines a region of the mass spectrometer between the ion source and the detector. The Examiner states that the ion mirror and the "field free region" are integral because the ion mirror is in this region. However, this does not mean that the ion mirror is necessarily integral with the flight tube per se. Applicant's flight tube as defined in claim 1 and shown and described in the application is a physical structure and not a "zone", "area", region or space. In other words, the ion mirror of the Zhang et al. can be in the field free area within a flight tube without being integral with the flight tube or even touching the flight tube. Also, there is no suggestion in Zhang et al. of the possibility that the ion mirror could be integral with the flight tube for any known flight tube structure. None of the remaining references discloses an ion mirror as defined in claim 1 or suggest that the ion mirror of Zhang et al could be integral with the flight tube. In view of the clear distinction between applicant's flight tube and electrode mirror combination and that disclosed in Zhang et al., claim 1 is believed to be clearly patentable over the reference of Zhang et al. taken alone or in combination with any of the remaining references.

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Claims 2-6 are dependent from claim 1 and are believed to be allowable along with their parent claim.

Claim 7 has been rejected under 35 U.S.C. 102(e) as being anticipated by the reference of Zhang et al. referenced above.

Claim 7 is directed to a three electrode ion mirror integral with a flight tube. Since there is no showing of an integral flight tube and mirror in Zhang et al. is not integral with a flight tube, claim 7 is believed to be patentable over Zhang et al. for the same reasons given in support of the patentability of claim 1.

Claims 8-11 are dependent from claim 7 and are believed to be patentable along with their parent claim.

Claim 14 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. and further in view of U.S. patent of Dowell 5,331,158.

Claim 14 is similar to claim 7 with respect to the integral relationship between the flight tube and is, therefore, patentable over Zhang et al. for the same reasons that were given in support of the patentability of claim 1. In addition, claim 14 specifies that the flight tube has an insulating inner surface and that the ion mirror is fixed to the inner surface. Although Dowell discloses a flight made of an insulating material, this reference does not show or suggest a ion mirror associated with the flight tube or, more specifically, an ion mirror fixed to the flight tube. Also, there is no suggestion in Dowell that the flight tube of Dowell could be fixed to the ion mirror of Zhang et al. Therefore, claim 14 is believed to be clearly patentable over the references of Zhang et al. and Dowell taken alone or in combination.

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Claims 15 and 16 are dependent from claim 14 and are believed to be patentable along with their parent claim.

In view of the amendments to the claims and the above arguments, it is felt that this application is in condition for a Notice of Allowance.

Should the Examiner have any question or reservations about this response, he is invited to contact the undersigned at his Worcester, Massachusetts office at 508-753-5533 or at his home office at 508-755-2421.

Respectfully submitted,
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